

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PRODUCT LOCATION METHOD UTILIZING PRODUCT BAR CODE AND PRODUCT-SITUATED, AISLE-IDENTIFYING BAR CODE

Inventor: Kenneth P. Glynn

Assignee: iVoice.com, Inc.

Attorney Docket No. IVC-106A

Kenneth P. Glynn, Esq.
Attorney for Applicant
Reg. No. 26,893
Glynn and Associates
24 Mine St.
Flémington, NJ 08822-1731
tele (908) 788-0077
fax (908) 788-3999
0070103100KPG-hd

PRODUCT LOCATION METHOD UTILIZING PRODUCT BAR
CODE AND PRODUCT-SITUATED, AISLE-IDENTIFYING BAR
CODE

5

(Attorney Docket No: IVC-106A)

BACKGROUND OF THE INVENTION

1. Field of the Invention

10

The present invention relates to item locators, i.e. item directories, which direct a user such as a consumer or shopper, to a specific location to view, retrieve, order, purchase or otherwise use the information obtained in the system. Such directories may be in list or booklet form, in-computer-based form, e. g. retrievable or presentable on screen, in print out, on-line, voice responsive or otherwise.

15

These directories may be stationary, e. g. as a posted list; portable, as in a sheet or booklet

form; audible, or in some other form, and may be activated as by some user action, e. g. pressing keys, speaking or otherwise. More specifically, the present invention includes a physical system and a method of collecting location data for directories and, in some embodiments, to actually create directories, which involves the use of product bar codes and product-situated, location-identifying bar codes. These are read and matched (coupled) and stored in a processor to provide location information to directory managers and subsequent users. Typically, the present invention could be used at retail stores to locate items to be purchased. Alternatively, it could be used at a production facility or distribution facility having a large number of

parts, to locate specific parts for as needed. In other embodiments, it could be used in non-commercial entities, such as public libraries to locate a particular book.

5

2. Information Disclosure Statement

10

The state of the art for acquiring product location information involves the use of manually collected, inputted data. Bar codes have been used for years to identify products, but not to identify locations.

15

The following prior art patents represent various inventions relating to machines involving speech recognition for voice-based operation and thus illustrate known voice recognition applications:

U.S. Patent No. 5,111,501 to Masanobu

Shimanuki describes a telephone terminal device equipped with a transmitter microphone, a receiver, a speech recognition unit that receives and recognizes speech signals from the transmitter microphone and a circuit to reduce the level of signals send from a telephone network to the receiver when the speech recognition unit receives speech signals from the transmitter microphone. Further, this device is preferably equipped with a speech reproduction unit that reproduces the speech information stored in a memory, in response to the information of recognition result from the speech recognition unit, and a circuit that prevents transmission of signals from the telephone network to the receiver when the regenerated

speech information is sent to the receiver.

Furthermore, it is desirable for this device to

be provided with a circuit that prevents

generation of ringing tones when an incoming call

5 arrives.

U.S. Patent No. 5,136,634 to David C. Rae et

al. describes voice operated facsimile machine

network which includes a method and apparatus for

transmitting specifically requested graphic

10 and/or textual data from an unattended database

storage location to a requestor's facsimile

machine over a telephone line which includes a

host computer such as a PC modified with a

facsimile transmission board and a voice

15 generation board. The host computer receives

incoming phone calls and prompts the caller using

the voice board to select data files by using the DTMF keys of a standard telephone handset. The PC can be left unattended and can run automatically in the facsimile transmission mode.

5 Callers can immediately access needed textual and image data with the use of just a standard telephone and facsimile machine. Multiple workstation nodes can be configured in a network setup to handle a high volume of calls in real time and to allow multiple data services to 10 operate simultaneously.

U.S. Patent No. 5,165,095 to Mark A.

Borcherding describes a method for dialing a telephone, using voice recognition to initiate 15 the dialing and to determine the correct telephone number. The dialing is initiated with

a spoken dial command that is recognized by using speaker independent templates that are stored locally with respect to the caller's telephone.

The correct telephone number is recognized by

5 using speaker dependent template that are

downloaded from a central database or by using speaker independent templates stored locally.

U.S. Patent No. 5,168,548 to Steven Kaufman

et al. describes a reporting system which is

10 disclosed herein, a speech recognizer which is

used to select selections of text from a report

form stored in a computer and to insert
recognized terms in the text thereby to generate

a report text under voice control. A command

15 interpreter, also responsive to spoken words,
initiates creation of the report text and its

subsequent storing, printing and transmission.

The command processor is responsive to respective spoken commands to select a destination telephone number and to cause the report text to be sent to apparatus for converting report text to image data and for modulating an audio band signal with the image data for facsimile transmission over telephone lines.

U.S. Patent No. 5,222,121 to Keiko Shimada describes a voice recognition dialing unit of a telephone mounted on a vehicle or similar mobile body and which allows a call to be originated with ease. When the user of the telephone enters a voice command on voice inputting section, the dialing unit originates a call automatically and thereby connects the other party to the telephone

line. In a call origination procedure, the operations for call origination and the verifications are performed between the user and the unit in an interactive sequence. In a 5 preferred embodiment, the unit has a particular call origination procedure in which, when the other party recognized by the unit is wrong as determined by the user by verification, lower place candidates for the other party are called up in response to a particular voice command. In 10 an alternative embodiment, the unit indicates the other party by voicing a name for verification purpose. The alternative embodiment selects and stores only the name of the other party in 15 response to an entered voice signal and, in the event of response for verification, combines the

name having been stored and response information stored beforehand to produce composite response voice.

U.S. Patent No. 5,231,670 to Richard S.

5 Goldhor et al. describes a system and method for generating text from a voice input that divides the processing of each speech event into a dictation event and a text event. Each dictation event handles the processing of data relating to 10 the input into the system, and each text event deals with the generation of text from the inputted voice signals. In order to easily distinguish the dictation events from each other and text events from each other the system and 15 method creates a data structure for storing certain information relating to each individual

5

event. Such data structures enable the system and method to process both simple spoken words as well as spoken commands and to provide the necessary text generation in response to the spoken words or to execute an appropriate function in response to a command. Speech recognition includes the ability to distinguish between dictation text and commands.

10

15

U.S. Patent No. 5,239,586 to Kuniyoshi Marui describes a voice recognition system which comprises a handset and a hands-free microphone for generating an input audio signal, a high-pass filter for eliminating low frequency components from the signal from the handset or hands-free microphone, a signal lever controller for adjusting the level of the high-pass signal in

response to the user of either the handset or
hands-free microphone, a storer for storing the
speech data and a controller for controlling the
storer so that a user's utterance is stored or
5 the user's utterance is recognized by comparing
the utterance to speech data already stored. The
handset hook switch provides an on-hook control
signal to reduce amplifier gain during hands-free
microphone operation.

10 U.S. Patent No. 5,301,227 to Shoichi Kamei
et al. describes an automatic dial telephone that
is useable in a motor vehicle, when a voice input
is provided during a period in which input of the
names of called parties is awaited, a voice
15 pattern of the name of the called party is
compared with reference patterns of called

parties stored in reference patterns storing
device, to determine the degree of the similarity
therebetween. The names of the called parties
are output to a user in the order of decreasing
5 degree of similarity. Each time the name of a
called party is output, a command word for
confirmation is waited from a user for a
predetermined time period. When a voice
confirmation command is input and is recognized
10 during this waiting period, a telephone number
corresponding to the name of the called party is
supplied to a channel. Consequently, the command
word for confirmation may be input only if the
name of the called party outputted is one desired
15 by the user. Sensors continually monitor the
driving condition of the motor vehicle in which

the telephone is installed. When the operation
of the steering wheel or brakes of the motor
vehicle exceeds a predetermined threshold or the
speed of the motor vehicle is excessive, the
5 sensors generate safety signals that inhibit the
operation of the telephone.

U.S. Patent No. 5,335,276 to E. Earle
Thompson et al. describes a communication system
which is provided with multiple purpose personal
10 communication devices. Each communication device
includes a touch-sensitive visual display to
communicate text and graphic information to and
from the user and for operating the communication
device. Voice activation and voice control
15 capabilities are included within communication
devices to perform the same functions as the

touch-sensitive visual display. The communication device includes a built-in modem, audio input and output, telephone jacks and wireless communication. A plurality of 5 application modules are used with personal communication devices to perform a wide variety of communication functions such as information retrievable, on-line data base services, electronic and voice mail. Communication devices 10 and application modules cooperate to allow integrating multiple functions such as real time communication, information storage and processing, specialized information services, and remote control of other equipment into an 15 intuitively user friendly apparatus. The system includes both desktop and hand-held communication

devices with the same full range of communication capabilities provided in each type of communication device.

U.S. Patent No. 5,349,636 to Roberto

5 Irribarren describes a communication system for
verbal telephonic communication which has a voice
message system for storing and retrieving voice
messages integrated with a computer database
accessing system for storing and retrieving text
messages from a separate computer system and for
10 converting the text messages into voice. The
systems are integrated via a network which
coordinates the functions of each individual
system. Additionally, the input/output ports of
15 the voice message system and the computer
database accessing system are connected in a

parallel fashion to at least one telephone line.

In this configuration a user may access both

voice messages and database information,

including text or electronic mail messages, with

5 a single telephone call. Optionally, facsimile

messages can be stored, retrieved and manipulated

with a single telephone call.

U.S. Patent No. 5,406,618 to Stephen B.

Knuth et al. describes a telephone answering

10 device that is activated by a proximity sensor

when a user crosses its field of detection and

whose operation is controlled by simple voice

commands. The device incorporates speaker-

independent voice recognition circuitry to

15 respond to spoken commands of the user that are

elicited by a system generated voice request

menu. The telephone answering device performs all the basic functions of a telephone answering machine in response to these simple commands and there is no need for the user to manually operate the telephone answering device.

5

U.S. Patent No. 5,602,963 to W. Michael Bissonnette et al. describes a small, portable, hand-held electronic personal organizer which performs voice recognition on words spoken by a user to input data into the organizer and records voice messages from the user. The spoken words and the voice messages are input via a microphone. The voice messages are compressed before being converted into digital signals for storage. The stored digital voice messages are reconverted into analog signals and then expanded

10

15

for reproduction using a speaker. The organizer
is capable of a number of different functions,
including voice training, memo record, reminder,
manual reminder, timer setting, message review,
5 waiting message, calendar, phone group select,
number retrieval, add phone number, security and
"no" logic. During such various functions, data
is principally entered by voice and occasionally
through use of a limited keypad, and voice
recordings are made and played back as
10 appropriate. A visual display provides feedback
to the user. During the various function, the
user can edit various different data within the
organizer by eliminating or correcting such data
15 or entering new data.

U.S. Patent No. 5,621,658 to Brion K.

Jackson describes an action contained within an electronic mail object which is communicated from a data processing system to another data processing system via an audio device. The 5 action is executable on a data processing system.

At the sending data processing system, the action is converted to a predetermined audio pattern. The electronic mail object may contain text in addition to an action. The text is also converted to an audio pattern. The audio 10 patterns are then communicated to the audio device over telephone lines or other communication medium. At the receiving end, the audio device records the object. A user can provide the recorded object to a data processing 15 system, which then executes the action and

converts the text audio patterns back to text.

In addition, the action can be converted to text and displayed on the data processing system.

U.S. Patent No. 5,631,745 to John J. Wong et
5 al. describes a telephone terminal adapted for
business or home use that includes the ability to
receive and send facsimiles, a voice answering
function and a computer modem. Various input and
output devices may be used for the facsimile
10 function. A voice annotated facsimile may be
sent and received. At the same time the
facsimile is viewed on a video monitor or
ordinary television set, an accompanying voice
message is heard through the sound system of the
15 monitor or television set. The terminal has an
architecture including a central processor and an

internal bus structure to which several types of
memory, various input-output devices and an
interface with the telephone line are connected,
among others. Audio Random Access Memory (ARAM)
5 is used for storing both facsimile data and voice
data.

U.S. Patent No. 5,671,328 to Gregory P.
Fitzpatrick et al. describes a method and data
processing system which are disclosed for
10 automatically creating voice processing template
entries. In one embodiment, the invention
automatically assembles a plurality of commands
received by the data processing system, at least
one of said commands having a voice recognition
15 criteria component associated therewith, counts
the occurrences of the plurality of commands,

assembles voice recognition criteria components
associated with the plurality of commands, and,
as a result of the occurrence count exceeding a
predefined minimum, constructs a voice
5 recognition template entry by associating the
assembled voice recognition criteria components
with the assembled plurality of commands.

U.S. Patent No. 5,850,627 to Joel M. Gould
et al. describes a word recognition system which
10 can: respond to the input of a character string
from a user by limiting the words it will
recognize to words having a related, but not
necessarily the same, string; score signals
generated after a user has been prompted to
15 generate a given word against words other than
the prompted word to determine if the signal

should be used to train the prompted word; vary
the number of signals a user is prompted to
generate to train a given word as a function of
how well the training signals score against each
5 other or prior models for the prompted word;
create a new acoustic model of a phrase by
concatenating prior acoustic models of the words
in the phrase; obtain information from another
program running on the same computer, such as its
10 commands or the context of text being entered
into it, and use that information to vary which
words it can recognize; determine which program
unit, such as an application program or dialog
box, currently has input focus on its computer
15 and create a vocabulary state associated with
that program unit into which vocabulary words

which will be made active when that program group
has the focus can be put; detect the available
computational resources and alter the
instructions it executes in response; test if its
ability to respond to voice input has been shut
off without user confirmation, and, if so, turn
that ability back on and prompt the user to
confirm if that ability is to be turned off;
store both a first and a second set of models for
individual vocabulary words and enable a user to
selectively cause the recognizer to disregard the
second set of models for a selected word; and/or
score a signal representing a given word against
models for that word from different word model
sets to select which model should be used for
future recognition.

Notwithstanding the prior art, the present invention is neither taught nor rendered obvious thereby.

SUMMARY OF THE INVENTION

5 The present invention is directed to a method of creating data for directories for locating items so that the directories are efficiently loaded with location data both prior to use by the customers or other users, as well as, in some preferred embodiments, so that the 10 directories may be updated as desired while in use. This method involves utilization of bar codes to determine item identity, and the use of separate bar codes to determine locations. These 15 separate location-identifying bar codes are physically located on the items (products), e. g.

on the product wrappings, for example, near the
product bar codes. These bar codes would identify
aisles, shelves, bin walls, parking spaces, etc.
This location data is read in conjunction with
5 item identification data by bar code readers, fed
to a processor in a recognizable combined format,
and then stored and used as the resource data of
the directory and/or becomes the directory
itself. Once the item/corresponding location data
10 is created, it may be used to print out or
publish directories, it may become available by
wireless service, by internet, or be screen
presentable or retrievable, as in the case of
keyboard/monitor type directories, or any
15 combination of the foregoing.

For example, a supermarket could assign

unique bar codes to each aisle, create bar code labels and attach them to one or more samples or units of each item, and then program the system according to the following simple process:

5

a) The processor will be programmed to read and identify products by the universal price code ("UPC") inputs from a bar code reader, and will likewise be programmed to recognize and identify locations by bar code inputs from a bar code reader, that is, the processor will be programmed to understand the codes created for particular locations to be included in the supermarket product location system;

10

b) The processor will also be programmed to match items (products) to locations when read before or after location readings. In other

15

words, when a reader inputs a location bar code from one item, and then reads the UPC or other item-identifying bar code of the item, this tells the processor to create a matching set of pairs of products and locations for each product read.

5 In an alternative embodiment, each type of item could be read after the location reading to create location data pairings. The created, stored data may then be used for the directory or
10 directories in any desirable manner and form, including those described above.

A locator system having these directories may be a stand alone device, but in many embodiments would be part of an internal
15 connected system. It could be an intranet or secured internet system, but would in many cases

be a storewide system with a plurality of user locations (units, phones, or microphones, with feedback at each location). The system could merely be a set of print outs at various 5 locations around the store or other facility, or could be one or more keyboard/monitor sets where a customer would type in the desired item (product), or the system could be more significant and include voice activation and/or 10 voice recognition and/or voice response. These more sophisticated systems could include an embedded voice-driven interface for speech control of: (1) operational instructions; (2) core system locator function operations, that is, 15 recognition of specific requests and responses thereto; and, (3) optional and default functions.

Thus, the system utilizing the present invention
method could include a device which is both
operated by speech (speech or voice activated)
and speech responsive (voice answers and
instructions to the user from the system). Thus,
5 the system may rely upon automatic speech
recognition (ASR), either in place of or in
addition to manual locator systems, e.g. book,
list, map and computer directories.

10

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention should be more fully
understood when the specification herein is taken
in conjunction with the drawings appended hereto
wherein:

15

Figure 1 illustrates a block diagram showing

the system and method of creating a directory in accordance with the present invention; and,

5

Figures 2a and 2b show a general schematic diagram showing software and functional features of a present invention method and its incorporation into a voice-based item locator system, including the present invention method of creating item /location data pairs.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

10

The present invention is a method and system for creating data for item location directories.

15

By "item" is meant a place or thing that a user desires to locate. Thus, a item could be a particular brand of canned string beans, a type of outdoor stain, a booth at a convention, a particular part in inventory for sale, assemblage

or distribution, a particular automobile in a production facility lot or in a large parking garage, or a room, a functional group or a person's desk in an office building or the like.

5 The "location" may be in the form of a word or sentence presented visually or audibly and/or it may designate an aisle, a shelf, a bin number, a room number, a row and slot or space, etc.

10 An important aspect of the present invention is the system of software and hardware (equipment) to utilize the present invention method of creating item location information for directories. It involves using item-identifying bar codes on items to be included and using 15 location-identifying bar codes for corresponding locations, also taken from the items. The

location-identifying bar codes are physically placed on the items themselves by the company which is stocking them.. For example, they are located on the items or products to identify 5 aisles, shelves, bins, drawers, floor area grids, etc.

The location-identifying bar codes may be custom created for the locations or may be established as a universal location system. 10 Alternatively, a manager could use existing UPC bar codes for the locations, provided that they were different from the items to be located, and provided that the system were programmed to correlate these particular codes to specified 15 locations.

The item-identifying bar codes are typically

located on the items themselves, but when more
than one identical item is included, a single
item of the set of identical items will be
sufficient for the method to work. However, it is
5 preferred that all items in each set have the bar
code located thereon. In some preferred
embodiments, the bar codes for the items are
Universal Price Code (UPC) bar codes, but the
present invention need not be limited thereto,
10 such as when it would be more appropriate to
create unique identifying codes for each and
every item, such as automobiles, artwork, etc.

The essential features of the present
invention system include the item-identifying bar
15 codes, the location-identifying bar codes, the
items and their locations, at least one bar code

reader and at least one processor.

Figure 1 illustrates the present invention in block diagram, showing a preferred embodiment of the method and system of creating a directory.

5 In this embodiment, a plurality of identical items comprise a set, and there are a plurality of such sets. Thus, there are a number of sets of items at a specific location, and a plurality of such locations. This model could be a department store, a grocery store, a hardware store, etc. As shown in the Figure, there are three different locations and each has three different sets of items. Location First 3 has Items A, B and C; Location Second 5 has Items D, E and F; Location Third 7 has Items G, H and I. Location First has its own unique identifying bar code 9; Location

10

15

Second has its own unique identifying bar code 11
and Location Third has its own unique identifying
bar code 13. Likewise, Items A through I each
have there own unique product identifying bar
5 codes, and, in this case, Universal Price Codes
(UPCs). Representative is Item A shown as item 15
with its own UPC 17, and with location bar code
20 likewise attached thereto.. Bar code reader 19
is used to read the location bar codes and
10 product bar codes in a manner consistent with a
program-required sequence (i.e. the sequence
must conform to what the software has been
programmed to expect, such as, first reading is
product, second reading is corresponding
15 location). The readings are processed to convert
optical readings to digital and the digital data

may be used to create hard copy, such as directory 23 shown, or screen presentation, or audio, or voice activated, or combinations of offerings for directory access.

5 Figures 2a and 2b show a general schematic diagram of a present invention method and its integration into a voice-based directory system, showing general software features and functional features. Thus, the present invention includes a
10 method, and a system with the software and hardware for the creation of item/location data pairs, as described above.

 In Figure 2a, the basic aspects of the item/location information data creation method
15 are set forth in schematic form. The unique item-identifying bar codes are attached 12 to at

least one of each different item for a plurality of sets of items, each set having items different from the items in the other sets. Likewise, unique location-identifying bar codes are attached 14 to the corresponding items situated at those locations, and, subsequently, they are read 16 in predetermined manner so that the program recognizes sequences and creates data sets, e. g. data pairs, to develop the item/location vocabulary for the system. This information is included in manager inputs 10 (referenced also in Figure 2b as inputs 13). The method shown in Figure 2a is repeated as needed for updating 18.

Figure 2b illustrates features of the overall item locator system in which the present

invention system and method are used, and includes a central processor 11 which may be an external or internal component, i.e., within a single unit or at a separate location from audio receivers and transmitters, e.g., microphones/speakers for user inputs and feedback to users.

The system may be preprogrammed with the user being required to follow concise instructions for activation and operation, or may be programmable to alter, add or enhance ease or methods of use, e.g. through a limited access code, for manager inputs 13 of user instructions.

In any event, manager inputs 13 shall include functional selections and inputs of items and their locations, with provision for subsequent

access for modifications. This programming may include direct keyboard, voice, etc., and, as mentioned, may include security capabilities for preventing unauthorized use, e.g. voice identification (user recognition) or user security code system, as well as other options which may be included therein, such as a "help" detailed manager instruction section.

Once the system has been programmed for use, the user operation unit(s) 15 provide functional access, which may be passive, i.e., the user speaks, picks up a phone, presses a button, or otherwise takes some action to activate the system; or it may be active, i.e., a proximity sensor, a periodicity timer, or other internal mechanism may automatically activate the system

and could trigger an audio or visual query, such as "May I help you locate a product?"

5

Once the system has been activated and a user has stated the necessary words of input to activate the device, recognition/non-recognition response 17 results from processing the user inputs to central processor 11, and audio and/or video response unit(s) 19 provide feedback 21 to the user, either by answering the inquiry, conditionally defaulting, e.g., asking for a repeat or a restate the question, or fully defaulting, e.g. directing the user to a courtesy desk or check out counter for additional assistance.

10

Obviously, numerous modifications and variations of the present invention are possible

in light of the above teachings. It is therefore understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described herein.

5

10

15